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BULLETIN No. 8

REPORT OF 1909

GEOLOGICAL SURVEY of LOUISIANA

G. D. HARRIS, Geologist-in-Charge

OIL AND GAS
in
Northwestern Louisiana
With Special Reference to the
CADDO FIELD

By G. D. HARRIS, Geologist, and
I. PERRINE and W. E. HOPPER, Asst. Geologists

Made under the direction of the Louisiana Experiment
Stations, W. R. Dodson, Director

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PREFATORY REMARKS.

During the last session of the State Legislature a small sum of money was appropriated for finishing the Survey work already more or less in hand. But after paying the printing bills on reports in press the sum left for investigation was very small. However, a few months were spent in the field during the fall of 1908 by the writer and Mr. Perrine. An appropriation of \$1,500 was made by the United States Geological Survey, permitting not only more work to be undertaken by the persons just mentioned, but also the hiring of Mr. Hopper, who remained in the field till the middle of February, 1909.

In preparing this very preliminary statement we have drawn freely upon the facts obtained both by State and National funds. The brevity of this report is owing to the need of some information on the subject at once. Again our State funds are not in a condition to admit of attempting to publish a more detailed report. Such a paper is, however, being prepared for publication by the United States Geological Survey.

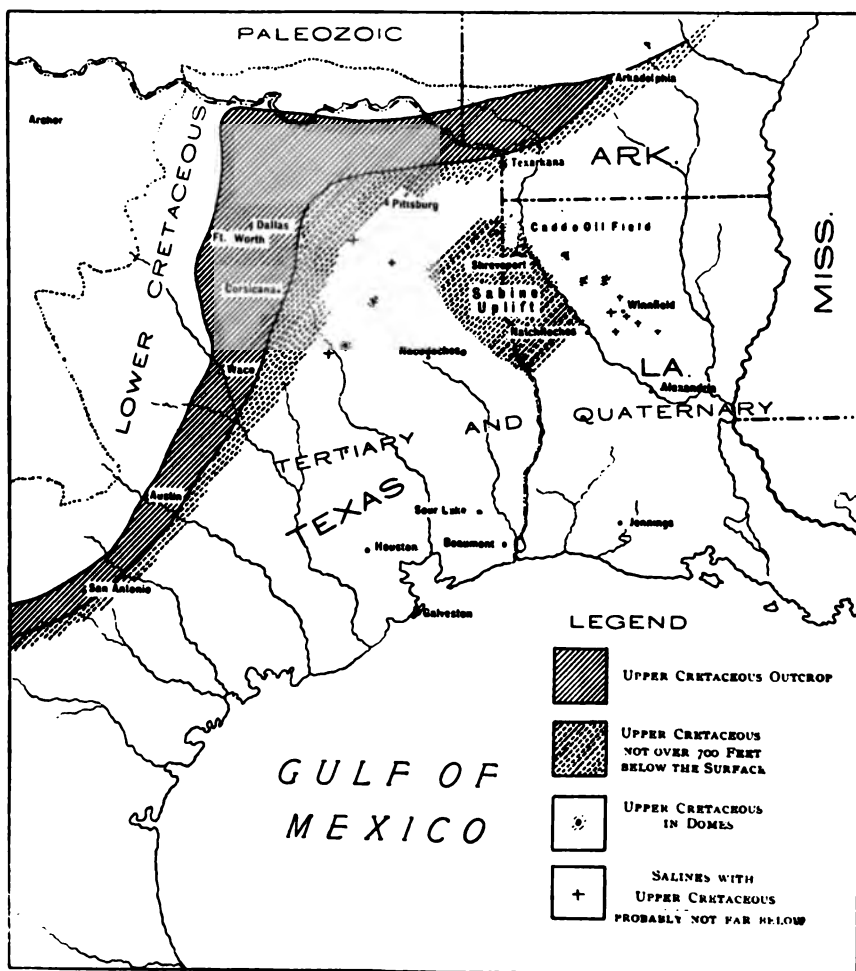


PLATE I. The northern outcropping of the various Upper Cretaceous (gas and oil-bearing) beds, is indicated by diagonal ruling. As they dip beneath the younger Tertiary and Quaternary beds to the southeast, and before they are covered by more than 700 feet of such later deposits, their location is indicated by broken lines. By extensive crustal movements, in the vicinity of the "Sabine Uplift" these Upper Cretaceous beds have been brought up near the surface, as indicated. For a discussion of the lesser uplifts, "domes," see Bull. No. 7 of this Survey.

OIL AND GAS IN NORTHWESTERN LOUISIANA, WITH SPECIAL REFERENCE TO THE CADDO FIELD.

STRATIGRAPHY OF NORTHWESTERN LOUISIANA.

We cannot here go into the history of the development of our knowledge of the stratigraphy of northwestern Louisiana. It may be gathered, however, by a perusal of our previous State papers, or, better still, from our forthcoming report to be published by the United States Geological Survey. (Report of '99, Part I; '02, pp. 1-16; '05, pp. 260-457; '07, pp. 60-150.)

The map shown as Plate I and the sections on Plate II indicate the outlines of the stratigraphy of the northwestern part of Louisiana and the adjacent areas of Texas.

Systems of Rocks.—We have here to deal with three systems of rocks: the Cretaceous, Tertiary and the Quaternary. Of these the Cretaceous occupies the lowest place stratigraphically, and was first deposited. Its rocks are more or less consolidated (hard) and contain, by the way, all gas and oil horizons of this region. Next above come the Tertiary clays and sands and large boulder-like concretions. Finally, near and at the surface generally, Quaternary clays and sands occur. In drilling a well the youngest, uppermost beds are first penetrated, then successively older beds are passed through so long as drilling is continued.

Structural Peculiarities.—The distribution of these various systems, together with the still older and underlying Paleozoic rocks, from Arkansas southward, and west of the Mississippi may be seen by consulting Plate I. An attempt is made on this map to show certain irregularities in the Cretaceous rocks whereby they are raised in certain places near or to the surface, whereas without these irregularities they would be buried hundreds or thousands of feet beneath Tertiary deposits. Plate II, A, will help to convey the same idea. Notice that if the Cretaceous beds beneath Texarkana continued to dip southward at the same rate till the Gulf was reached they would be many times deeper beneath the surface than they doubtless really are. In fact, at Vivian, a reverse or north dip of high angle occurs, bringing the Cretaceous beds within 700 or 800

feet of the surface. Then, to the south, to beyond Mansfield, no dip occurs, so that, as shown on Plate I, the Cretaceous beds may be found in this, what we term the *Sabine uplift* over a large area, buried not over 700 feet beneath Tertiary deposits. Minor uplifts, due probably not mainly to great crustal movements like that just described, but to concretionary growths of salt and gypsum, are to be seen to the east and west of the Sabine uplift. For an elaborate account of such minor, or salt and gypsum uplifts or domes, see Bulletin No. 7 of this Survey. Reference should also be made to that Bulletin if a knowledge of the areal distribution of the various Eocene stages is desired. In southern Louisiana and southeastern Texas local dome structure has served to collect enormous quantities of oil, as at Beaumont, Sour Lake and Jennings. In northern Louisiana, such structures are known to furnish some gas and oil, but scarcely in paying qualities. It is the great Sabine uplift that affords the proper structure for the collection and retention of great quantities of oil and gas in northwest Louisiana. The boundary of this uplift to the north, in the vicinity of Vivian, as shown by Plate II, A, is clearly defined. Likewise to the south, from near Natchitoches to the Sabine. So, too, there is apparently a high dip to the east, in the Cretaceous beds along the course of Red River. But to the west we have no sure proof that the Sabine uplift (indicated by interrupted lines on Plate I) may not be continuous with the interrupted line area further west in Texas. In other words, the insular mass, represented as the Sabine uplift on Plate I, might perhaps be more properly shown in the form of a peninsula connecting with the main land toward the west. A few wells, however, scattered from Shreveport to Dallas will soon determine this point and hence prove or disprove the existence of oil-collecting structure in this part of east Texas. The existence of a depression in the underlying rocks, or, in other words, of synclinal structure between Shreveport and Corsicana, whereby the Cretaceous may be more than 700 feet beneath the surface, we have inferred from the extensive display of Claiborne Eocene deposits in Rusk, Cherokee, and Anderson counties. Note that in Plate II, A, the Sabine Eocene is the surface rock over most of the Sabine up-

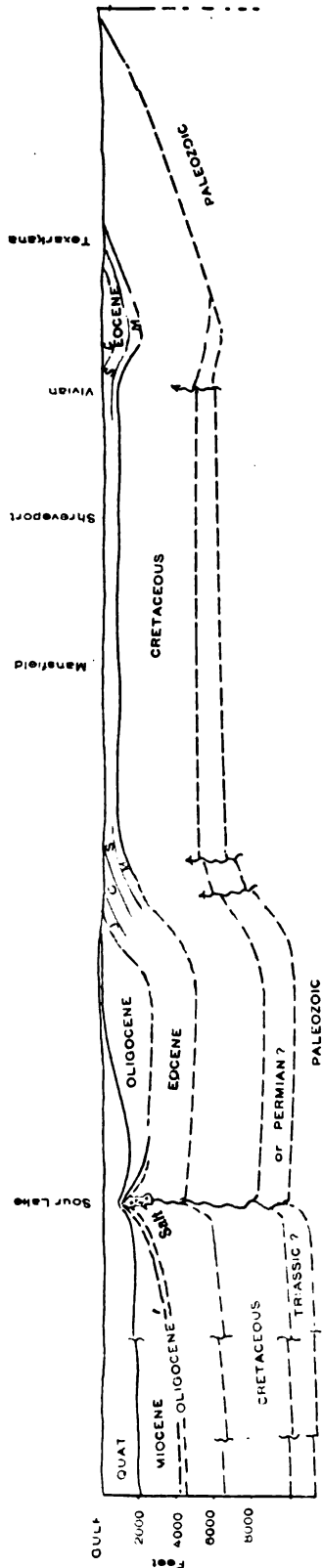


PLATE II. A—Generalized section from the Paleozoic outcrop in Arkansas, through Texarkana, the Sabine Uplift, Sour Lake, to the Gulf of Mexico near Galveston. The letters J, C, S, and M refer to the Jackson, Claiborne, Sabine and Midway stages of the Eocene series. Notice particularly the deep trough north of Vivian and the steep south dip south of "Mansfield."

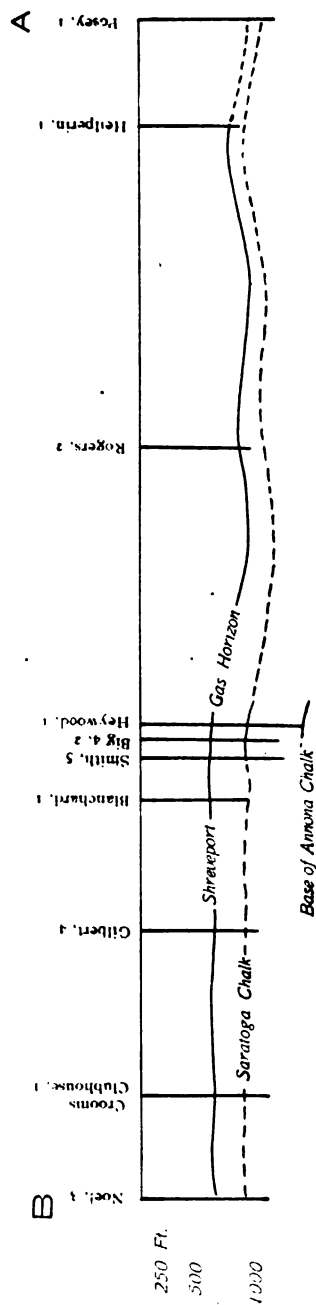


PLATE II. B—Section in the Caddo Oil Field along the heavy dotted line A-B on PLATE III. Notice the very slight undulations in the various beds.

lift. Claiborne Eocene occurs only in depressions and about the periphery of the uplift as shown by Plate II, A.

So far as we can now judge there is no reason why the border regions of the whole Sabine uplift may not be looked upon hopefully as oil and gas territory. We are naturally quite aware that the proper structure for gathering and retaining oil and gas may be present where there has never been a supply of these substances. It is one thing to have a system of pipelines and tanks for properly collecting and storing oil, and often quite another to have these receptacles full of oil. Until the origin of these substances is better understood, no one can tell with any degree of certainty where they may occur. But, given a certain amount of them in the underlying rocks of a region, structure plays a very important role in determining where they will collect in paying quantities. Caddo field is near the north angle of the Sabine uplift. Its oil and gas evidently come up the north and east slopes of this uplift and then become entrapped beneath Upper Cretaceous and Eocene impervious beds. But the final distribution of these substances over the field is seemingly due to secondary structural features, slight anticlines and difference of porosity of the rocks in which the oil is contained. We have suspected that the two directions of the shore lines of Ferry Lake and other topographic features have something in common with the structure in the underlying rocks. Mr. Perrine, who has assisted us in this investigation, has indicated, tentatively, the position of certain anticlines and synclines from data collected in the field from well logs, during November and December, 1908. These slight anticlines are seen in section in Plate II, B. They are certainly slight, but mean a great deal so far as production of oil and gas are concerned. The section is drawn along the heavy dotted line A-B, on Plate III.

KNOWN GEOGRAPHICAL LIMITS OF PAYING PRODUCTION.

So far as oil is concerned, the map, Plate III, herewith given, covers all the known producing territory of the Caddo field. The Posey well No. 1, one mile northeast of Vivian, was dry; but others along the anticline to the south as indicated on the map are small producers of heavy oil. Passing south along the

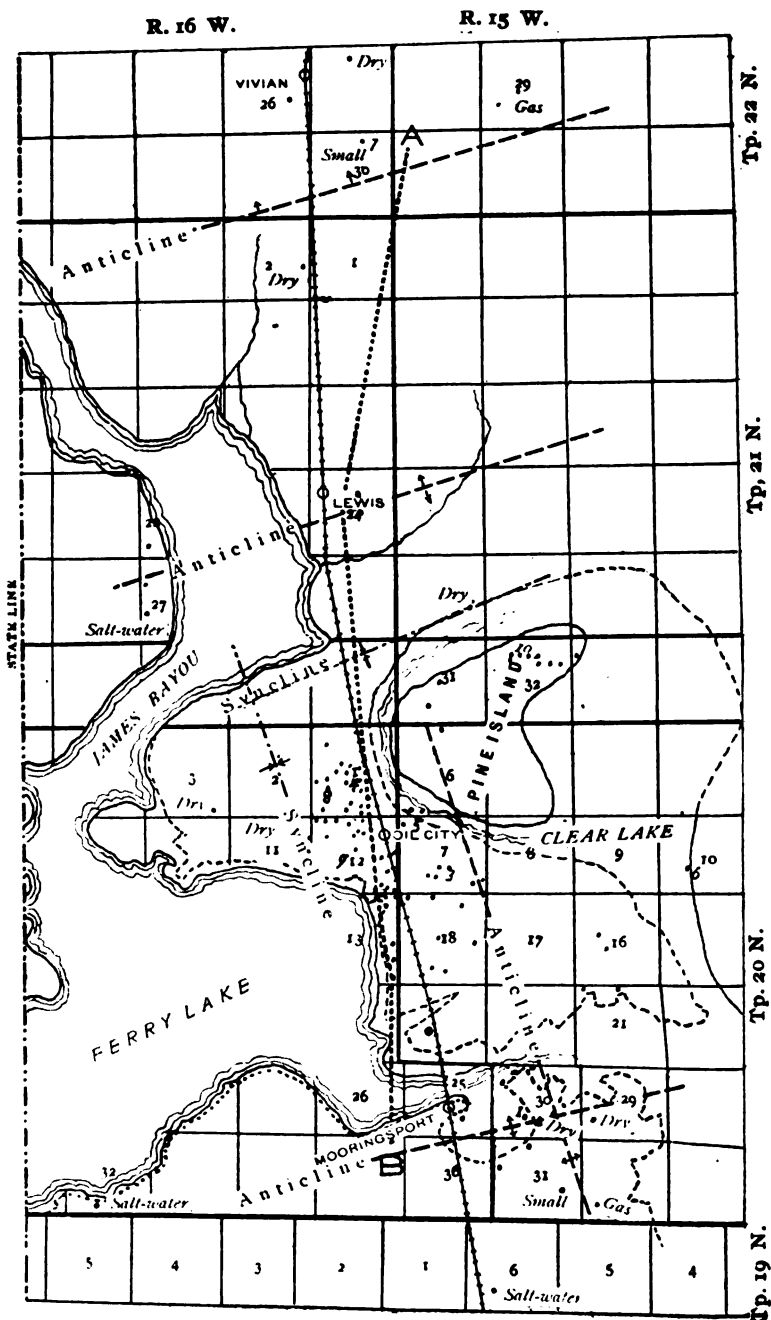


PLATE III. Outline map of the Caddo Oil Field, showing location of section A-B (Pl. II, B), most probable location of slight anticlines and synclines, areas of greatest present development (wells shown by dots), location of limiting Dry or Salt-water wells, location of wells (numbered in italics from 1 to 10) from which samples were obtained for analysis. (See analyses, page 20.)

Vivian region: Little oil, heavy; much gas. Nacatoch horizon.

Lewis region: Little oil, heavy; much gas. Nacatoch horizon.

Pine Island: Gas from the Nacatoch sands; heavy oil and gas from the Woodbine.

Oil City, Sections 1 and 12: Gas from the Nacatoch, Austin and Woodbine; light oil from the Austin, locally; heavy oil from the Woodbine.

Oil City, south of, Sections 13 and 18: Gas in the Nacatoch and Woodbine; light and heavy oil in the Woodbine.

Mooringsport: Gas in the Nacatoch and Woodbine; light oil in the Woodbine, Sections 26, 25, and west 1-2 of Section 30.

Kansas City Southern railway beyond the "dry" territory in Sect. 2, to the vicinity of Lewis, a few small producers are met with from the same sand that occurs in the Vivian wells. Across James bayou, in Sections 22 and 27, the same horizon is being exploited. Small wells of heavy oil, with gas and salt water, are there met with. From Pine Island to Mooringsport the territory is generally productive. So far, however, there is little to encourage "wildcatting" over a mile west of the range line between RR. 15 and 16 west. Sections 2, 3 and 11, north of Ferry (Caddo) Lake and section 32 to the south have proven unproductive; likewise wells near and to the south of the line between Tps. 19 and 20 N. Little oil has been found over a mile east of Mooringsport. But four miles east of Oil City, in section 10, there is a good well, producing from 100 to 400 barrels daily. Section 18, one mile southeast of Oil City, seems not only to be the central part of the largest developed area, but it also yields oil, in many instances of superior quality.

GEOLOGIC HORIZONS OF OIL AND GAS.

Gas and oil occur separately or together in at least four horizons in the Caddo field. However, as already remarked, they are all in the Cretaceous system. They occur in the Nacatoch, Austin, Eagle Ford and Woodbine stages, as indicated in the following table:

Generalized Section of the Caddo Field

SYSTEM	SERIES	STAGE	KIND OF MATERIAL	Approx Thick's Feet	Approx Depth Feet
Quaternary			Red and gray sand, clay; gravel	20	20
Tertiary	Eocene	Sabine	Dark lignitic sands and clays, with calcareous boulders.	430	450
		Midway	Dark clay, with occasionally a lime stone bed.	200	650
	Montana	Arkadelphia	Dark stiff clay.	150	800
		Nacatoch	"Shreveport" or "Caddo" gas sand; contains some hard layers.	130	930
		Marlbrook	Blue marl with chalky layers about 1150 ft. (Saratoga chalk)	350	1280
Cretaceous (Upper)	Colorado	Austin	Chalky layers with many fossil fragments, often with strong odor of oil. Occasionally good Oil, about 1575 ft. Gas common. The so-called Annona chalk.	320	1600
			Clay, chalk and sand, with hard pyrite layers. The Browns-town beds.	200	1800
	Eagle Ford		Blossom sands. Gas at 1800 ft.	50	1850
			Blue tough clays with hard limestone and pyrite layers. The "Eagle Ford clays."	350	2200
	Dakota	Woodbine	These sand beds are reached at depths ranging from 2140 to 2300, according to local structural features. They contain the "deep" Oil and Gas of the Caddo fields. Salt water common, thickness unknown, (100 ft.)		

The Nacatoch Stage.—This stage furnishes practically all the gas now being used. It is generally dry, but sometimes it is accompanied by salt water. About 800 feet may be taken as the average depth of this sand in the Caddo field, in its restricted sense, though variations of 50 feet more or less must be expected owing to topographical and structural features. The inference must not be made that until a depth of 800 feet

is reached there are no gas "showings." These are often very noticeable between 600 and 800 feet. At Lewis and to the west of James bayou this sand is a little over 1,000 feet down; and in the Trees wells, in the last-mentioned locality, considerable heavy oil and salt water (300 barrels daily of each, in one instance,) came from this horizon. Again, near Vivian, in section 36-22-16, three wells in this "shallow sand" are reported good for 150 barrels of oil, with about eight times that amount of water. Three miles east, the Busch-Everett people estimate an 8" hole 1,036 feet deep (Sect. 29-22-15) capable of furnishing 75,000,000 cubic feet of gas daily.

We have little hesitation in stating our belief that this is the horizon furnishing the "heavy oil" in the Powell field just east of Corsicana, Texas.

The thick, stiff Arkadelphia clay beds above, furnish an excellent capping for the hydro-carbons collecting in this bed. The porous sands, over 100 feet thick, allow of easy movement of the gas between the sand grains. But in some instances the capacity for holding gas is seemingly increased by the cavities in the silicious rock layers left after the calcareous marine shells have been dissolved out. It is unnecessary usually to go but two or three feet into the sand to obtain an enormous supply of gas. This method of procedure lessens the danger from salt water. Certain Vivian logs, however, record penetrating the gas sand for 15 or 16 feet. The top of the sand is nearly 400 feet above the Austin chalk. From about this horizon the oil and gas in the Corsicana field are found. See statements in the generalized section in Texas given below:

Generalized Section of the Austin Quadrangle

SYSTEM	SERIES	STAGE	KIND OF MATERIAL	Approx Thickn's Feet
Quaternary			Silt, sand and gravel.	40
Tertiary	Neocene	Uvalde	Gravel.	50
	Eocene	Lytton	Clay, sand and sandstone.	300
Cretaceous (Upper)	Montana	Webber- ville*	Black, slaty, bituminous clays with occasional harder layers. Distinguished from the Taylor marl by its glauconitic particles.	400
	Colorado	Taylor	Blue unctuous marly clay ("joint clay"), weathering into yellowish subsoil and black soil.	540
		Austin	White chalk with conchoidal fracture. Marly in upper portion.	410
		Eagle Ford†	Blue clay and flaggy limestone.	30
Cretaceous (Lower)			(These beds have not been reached in the Caddo field.)	

* Slight amounts of oil and gas are reported by Hill and Vaughan from the Webberville beds about Austin. The Corsicana oil is, according to these authors, from the Webberville beds.

† About Austin the Eagle Ford clays contain a slight amount of oil. (See Austin folio, U. S. G. S. No. 76, p. 7.)

Whether the light Corsicana oil from the town of Corsicana, Texas, comes from the Nacatoch, or the equivalent *Webberville beds*, as stated by Hill and Vaughan, or whether they form the Texas representative of the Marlbrook, *i. e.*, the *Taylor beds*, as stated by Adams, we cannot now say positively. However, we are inclined to believe Adams' view is the correct one; also, that conditions in Marlbrook days may have been locally more or less like those obtaining earlier in Austin times. We shall see below that the Annona beds of the Austin stage sometimes furnish a large quantity of high-grade oil.

Corsicana field.—Apropos of looking for other oil horizons in beds penetrated in and about the Caddo field, a few facts are

given from the Corsicana field. The old Corsicana field was formerly described as one mile wide east and west and four miles long north and south. The rocks dip 50 feet to the mile, south, 70° east. Depth of the producing sand varies from 950 feet in the north to 1,175 in the south. Toward the east the sands are filled with salt water, toward the west they pinch out or contain very little oil. They are capped by impervious "l'onderosa marl." In the Powell or heavy oil field the dip is still easterly and the wells may strike productive sands from 700 to 800 feet down. Clearly the Powell oil is from a somewhat higher horizon than the light, Corsicana oil. It is also interesting to note how the production has varied and held out in the Corsicana and nearby Powell fields. In the former, wells that were furnishing from 10 to 30 barrels daily when first put down in 1897 were furnishing about half that amount in 1902, or five years afterward. These two Texas fields produce approximately 500,000 barrels annually. But in 1900 the Corsicana field alone ran as high as 800,000 barrels. In 1907 about the same amount was again produced by the combined fields, but about 600,000 barrels came from the heavy-oil, Powell field.

Analysis of Corsicana Oil.—The Corsicana product has been analyzed on several occasions. Dr. Thiele's analysis, as quoted several times in the "Mineral Statistics of the United States Geological Survey," is as follows:

	Per ct.	Sp. Gr.
Naphtha	10.8	0.710
Kerosene (illuminating product mainly)	54.5	0.796
Residue	34.7	0.906

More elaborate analyses may be found in Mineral Statistics for 1901 and 1902.

We strongly suspect that the Lea development reported from seven miles north of Corsicana, where 7 barrel wells of 42° B oil, are found in a "sand" 725 feet deep, are in the lower beds of the Marlbrook or perhaps even in the Austin chalk.

The Austin Stage.—At about the central part of this stage (or near the base of the so-called Annona chalk), gas and strong

petroleum odors are generally met with. But sometimes, as in the C. G. No. 1 on the Caddo Lake Oil and Pipe Line Company lease, SW, SW, 1-20-16, it yields a large amount of excellent oil. In this case it is clear, from comparative depths to various strata in surrounding wells that were failures, that the well is located on a slight dome; moreover, the limestone seems to be very porous. This well was credited with a flow of 3,000 barrels at first, though it soon dropped to 1,000; gravity, as reported in the Oil Investors' Journal, is 42° B. The first well in the field, the old Savage and Morrical well No. 1, yielded a barrel or so a day of 34.7 B. oil from this horizon. Even as far east as Pine Island, this oil-bearing stratum has been noted. It there was reported to have a depth of 1,640 feet.

The Annona chalk furnishes an excellent means for determining structure in this part of the State, since it varies so markedly in appearance from the usual dark clays and sands. The "cuttings" are white and appear like fragments of plaster scattered about over old well dumps. During the process of drilling, this chalk renders the return water as white as milk. The presence of Annona beds in the Caddo field, ranging in depth from 1,270 to 1,600 feet in depth; the occurrence of the same beds at about the same depths in the Blocker well ten miles southeast of Marshall, Texas, also at the same depths in the Shreveport wells; while in the well five miles northwest of Plaindealing they are first met with at a depth of not less than 1,750 and perhaps 2,300 feet, according to different logs of the same, all show clearly the plateau-like character of the structure we have styled the Sabine uplift.

The Eagle Ford Stage.—This stage is said to show slight oil signs in the Austin, Texas, region. At Clarksville it furnishes in its upper member, the Blossom sands, a good supply of soft water. In the Caddo field, this upper sandy member is of variable thickness and often shows excellent signs of oil and gas. Salt water is prevalent in this horizon, but doubtless the gas may be utilized after the depletion of the shallower horizon. In the lower Eagle Ford Clays, pyrite nodules and layers are common, and drilling in them is sometimes very slow and expensive. These layers, embedded in tough clays,

aggregate over 300 feet in thickness and form an excellent cap for the gas and oil in the Woodbine sands below.

The Woodbine Stage.—The “sand” of this stage furnishes nearly all the oil in the Caddo field. In the central part of the field it may be looked for between 2,225 and 2,265 feet, while on Pine Island it is perhaps generally about 100 feet less in depth. That there is in the center of the fields as now developed no simple sand bed from which all wells derive their supply of oil is clear from the somewhat varying depths of best supply and the difference in the gravity of the oil. The Gilbert No. 1, for example, is probably deriving its oil from a depth of about 2,245 feet; its gravity is 39° B. The Filer well, scarcely a mile east, at about the same depth produces oil with a gravity of 22° B. Some wells in section 12 are credited with a producing depth of 2,300 feet. In one instance a strainer 40 feet long extended from 2,225 to 2,265 feet in the wells, showed little oil at first, but in a few hours produced a large quantity of excellent oil from an unknown depth. A Busch-Everett well in section 30, just west of Dixie, showed a little oil at 2,330 feet.

OIL PRODUCTION OF THE CADDO FIELD.

The following figures, taken from the Oil Investors' Journal, will give a good idea as to the amount of oil produced thus far in the Caddo field:

1905.....	Bbls.
1906.....	4,650 (1,510 shipped)
1907.....	48,266
1908.....	513,504

At semi-monthly intervals, the same authority furnishes the following estimates of daily production for the last twelve months:

May 15, '08, 1,450 bbls.; May 31, 2,010; June 15, 2,200; June 30, 2,285; July 15, 2,000; July 31, 1,700; Aug. 15, 2,000; Sept. 15, 2,000; Sept. 30, 4,500; Oct. 15, 2,700; Oct. 31, 3,600; Nov. 15, 3,100; Nov. 30, 1,900; Dec. 15, 3,750; Dec. 31, 3,000; Jan. 15, '09, 3,275; Jan. 31, 2,700; Feb. 15, 2,100; Feb. 28, 2,580; March 15, 3,000; March 31, 2,850; April 15, 3,100; April 30, 2,930; May 15, 2,650; May 31, 3,100.

It is quite probable that the production of the field for 1909 will be about 1,000,000 barrels. This means that in oil alone it will surpass the maximum output of the combined Corsicana-Powell fields.

Concerning the importance of the Caddo oil field and the mode of occurrence of the oil, we still hold the same opinion we expressed in the *Oil Investors' Journal*, Nov. 6, '08:

It is a most important fact to note that this field is not one of extreme local concentration. It has nothing in common with the Beaumont or Jennings fields, but everything, save age, in common with those of western Pennsylvania, West Virginia, Ohio and Illinois. Its vastness speaks well for both quantity of oil and gas and the longevity of the field.

The comparative slowness in development of the Caddo field has frequently been commented upon. This slowness has been due to the fact that the earlier, shallower wells were troubled with heavy gas pressure and furnished little oil. The first really successful deep wells furnished heavy oil. Richardson No. 2, on the Etcheson and Mayfield land, section 32-21-15, was a fine producer at the start, being rated as 300 barrels per hour. It went to mud and water in a day or two and sanded up. September 6, '08, the C. G. O., on the Gilbert tract, came in with a daily production of 400 barrels of light oil (see table of analyses). Producers' Nos. 1 and 2, on the Lane tract (section 18-20-15) were also soon brought in, showing high-grade oil and larger quantities than furnished by the Gilbert well. The same high-grade oil was known to exist in the Hostetter well, east of Mooringsport, for over a year before the exciting days when the Guffey-Hostetter No. 2 was completed. The latter event took place in December, '08, and rumor had it that a 10,000-barrel well had been brought in. Shipments from Mooringsport, however, soon showed that the new well was making about 300 barrels daily.

Upon the whole, Producers' No. 2, on the Lane tract, as noted above, has been the best well in the field so far. It commenced flowing in September, 1908, at a reported rate of 1,000 barrels daily and as late as March, '09, was still flowing 500 barrels daily.

Good quantities of high-grade oil (see analysis of Gilbert No. 1, p. 20), have been produced, therefore, from the "deep

sand" (Woodbine), in sections 13 and 18, about a mile south of Oil City and in section 30, east of Mooringsport. Other localities furnish from this horizon a heavy oil, often with much salt water.

Local, porous lenses in the Austin chalk, as already mentioned, in section 1, three-quarters of a mile northwest of Oil City, also furnish a fair supply of high-grade oil.

Small quantities of heavy oil are found in the Nacatoch sand—west of James Bayou, sections 27 and 22—three wells furnishing 85 barrels daily; the Rogers well, at Lewis, 30 barrels; the Vivian Oil Company three wells, in section 36, near Vivian, 150 barrels.

SHIPPING FACILITIES.

Until the present summer ('09) practically all shipments had to be made by the Kansas City Southern railway. Loading racks were established at Caddo, Oil City, and Mooringsport. Now, a 6" pipe has been constructed from the Caddo field to Grigsby's Island, just south of Shreveport. This will permit of railway shipments over at least a half dozen roads, as well as water transportation on the Red River. Doubtless, too, the connection of the field with the Standard's pipe line from Oklahoma to Baton Rouge is a matter of the near future.

ANALYSES OF CADDO OIL.

In collecting samples for analyses it was our intention to get representative samples from all oil-producing horizons and from localities as widely separated as possible. Note: Sample No. 7 is from the "shallow sand" (Nacatoch) horizon; No. 4 is from the Annona chalk; Nos. 1 and 2 are from the deep sand light oil beds; others are "deep sand" (Woodbine) heavy oil beds. Again, sample 1 is from Mooringsport; 7 is from Vivian; 8 is from the western part of the field; 10 is from Pine Island, and 6 is from across Black Bayou. The analyses, though not complete, certainly give a very fair impression of the character of the oil being now obtained from the Caddo field. The location of the wells may be seen by consulting Plate III. The figures in italics indicate the well from which samples were taken.

Salt water and gross impurities are separated from the oil

by boiling in huge tanks, near the bottom of which a series of steam pipes are located (see Plate IV, A).



PLATE IV. A—"Boiling tank" for the elimination of mud and salt water from the oil.

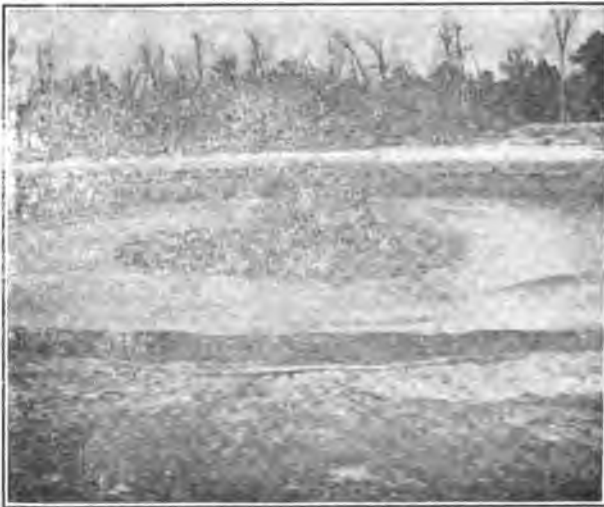


PLATE IV. B—Caddo Gas and Oil well, Gilbert tract, old No. 1, "running wild." Probably 25,000,000 cubic feet of gas has escaped here daily for over three years. The gas caused the thick, heavy red, muddy water to have the appearance of boiling violently. (See page 21.)

Number of Specimen	LOCATION OF WELL	Number of Well	Depth of Well	Physical Properties		Begins to Distill at	DISTILLATION - Engler's Method			REMARKS	Geological Horizon by G. D. Harris
				Gravity 60° F.	Specific		By Volume				
							To 150° C	Cubic Centimeters	(Cubic cent. 150°-300° C. Specific Gravity)		
1	Hostetter Farm, Mooringsport.	1	2210	0.8187	41	138	3	55	0.7778		Woodbine
2	Caddo Oil, Gilbert No. 1 N. E., N. E. S. 13-20-16	1	2245	0.8264	39 4	136	115	49	0.7778		"
3	Frank Filler, N. W., S. E., 8-7-20-15	1	2240	0.9211	22 0	200		12	0.8510	Contains Water	"
4	Old Caddo Gas and Oil Co. Oppenhanser tract	1	1629	0.872	33 5	210		28	0.8299		Austin
5	Richardson well NW, NW, Sect. 7-20-15	2	2245	0.8929	26 8	173		20	0.8408		Woodbine
6	Black Bayou Oil Co. S-W, Sect. 10-20-15	1	2229	0.9150	23 0	210		18	0.8450		"
7	Dawes well, (1 mile East of Vivian) NW, NE, Sect. 36-22-15	1	1059	0.9253	21 3	205		17	0.8406		Nacatoch
8	Caddo Gas and Oil Co. E. K. Smith tract	4	2460	0.9211	22 0	200		14	0.8142	20% H ₂ O; 0.7% clay	Woodbine
9	Producers-Caddo Oil and Min. Co. NE, NW, 12-20-16	6		0.8883	27 5	220		18	0.8406	Much Water	"
10	Richardson Oil Co. NE, NW, Sect. 32-21-15, Pine Island	4	2132	0.9121	23 5	220		16 5	0.8713		"

NOTE:—All the above specimens were black in color, except No. 8, which was brown. The odor of the above specimens is like that of Oklahoma oil. No sulphur was found present in any of the samples. U. S. Geol. Survey.

GAS IN THE CADDO FIELD.

Gas, in immense quantities, seems to have a more general distribution than oil in the Caddo field. For years gas has been known from the Nacatoch sands beneath Shreveport. Its real significance, however, has been appreciated only of late. From Mooringsport north to Vivian and from west of James Bayou east to Dixie, gas has been found in enormous quantities. This field first attracted the attention of the general public by its famous burning gas wells or so-called "burning geysers." Producers' No. 2 "blew out" in May, 1905, with terrific force. The gas caused the waters in and about the well to present a boiling, churning motion, that loosened up the earth some yards around the well, engulfing the derrick and machinery in a mass of liquid earth. On June 18 the gas was lit and thereafter for five months this geyser attracted visitors from all parts of the country. Major Frank M. Kerr visited the well in behalf of the State to see what might be done to stop the waste of gas; and, in his report to the Governor, says in part:

On the day of this visit the well presented a scene of magnificent energy and surprising spectacular effect. A basin or bowl of water some 250 feet in diameter has resulted from the action of the escaping gas, and the roll of the waves from the mouth of the orifice toward the rim of the basin is like waves on a sea beach in stormy weather, from the centre of which leaps a flame some 30 feet in diameter and equally high. This, with the monster upheaval of water and leaping of spray, presents a spectacle which might readily have been likened to the display of a prismatic fountain of unusual magnitude and superb effect.

Producers' No. 3, in the same vicinity, *i. e.*, a few hundred yards west of Oil City, repeated the history of No. 2 in a somewhat milder form during the latter part of 1906 and early part of 1907.

Caddo Gas and Oil Company's well No. 1, on the Gilbert tract in the eastern part of section 13, perhaps 200 yards west of the railroad and about one and a quarter mile south of Caddo City, has had a remarkable history as a "geyser" or "wild well." After a period of over three years of constant eruption it still appears vigorous, as shown by the accompanying figure (A, Plate IV). The description of Producers' No. 2, given above, with but slight modification of details, fits this well excellently. When lighted, the heat of the flames raises the

water to the boiling point; the tumbling and seething of the waters and the roar of the escaping gas and the light and heat of the leaping flames produce an impression long to be remembered. The details of the boiling, red, muddy waters appear more clearly when the well is not on fire, as shown by the figure. The "crater" is about 300 feet in diameter. The greatly disturbed central part of the circular body of water is over 30 feet in diameter. When lighted the flames are from 20 to 60 feet high.

Another famous "burning well" was that known as Dawes Trustee No. 1, NE. NW, Section 7-20-15. A brief history of this well is given under "Alphabetical List of Wells in the Caddo Field." This well alone probably wasted 40,000,000 cubic feet of gas daily between the middle of May, '08, and February 12, '09.

During the latter part of 1908 we estimated the daily waste of gas in this field to be about 70,000,000 cubic feet.

In June, 1908, the Oil Investors' Journal correspondent listed the producing gas wells of the Caddo field as follows:

Producers' Oil Co., Heilperin and Liebman, Sec. 6, 2,200 ft., 2½" hole, 8 million gasser, rock pressure 900 lbs.

McGuire No. 1, Barron, Sec. 17, 802 ft., 20 million.

McGuire and Evans No. 2, Sec. 18, 812 ft., 15 million.

McGuire and Evans No. 3, Sec. 18, 2,000 ft., north of No. 2, 15 million.

McGuire No. 4, Barnhardt, Sec. 21, 812 ft., 15 million.

McGuire No. 5, Huckaby, Sec. 17, 823 ft., 25 million.

McGuire No. 6, Walter Crawford, Sec. 15, 1,500 ft., north of McGuire No. 4, 15 million.

McGuire No. 7, Barnhardt, Sec. 21, half mile east of McGuire No. 4, 795 ft., 15 million.

J. B. & W. S. Atkins, NE. NW, Sec. 18, Evans, 15 million.

J. M. Guffey Petroleum Co., Hostetter No. 1, 810 ft., 15 million.

Dixie Oil and Pipe Line Co. No. 2, southeast part of Pine Island, 800 feet, small gasser.

The following gas wells have been announced in this journal since June, 1907:

McGuire No. 9, school land, Sec. 16, 805 ft., 20 million.

Culliman and Jolly, No. 1, 810 ft., 25 million.

McGuire No. 10, school land, Sec. 16, 825 ft., 20 million.

Dixie No. 2, Glassel, 5½ miles east of Mooringsport, Sec. 36.

McGuire No. 11, school land, 25 million.

Caddo Gas and Oil, Pardue, Vivian, 2½ million.

Caddo Gas and Oil No. 9, Mooringsport, 8 million.

Caddo Gas and Oil No. 10, Mooringsport, 10 million.

Caddo Gas and Oil No. 11, Smith, 15 million.

Producers' No. 2, Murray, NW, SW, Secs. 7-20-15.

McCann & Harper No. 1, Pitts, NE, NW, Secs. 31-22-15, Vivian, 50 million.

Busch-Everett No. 1, Douglass, SW of Secs. 30-20-14, Dixie, 10 million. Dry at 2,330 feet.

Busch-Everett No. 1, Vivian Mercantile Co., Secs. 29-22-15, 60 million, 8" hole, depth 1,040 feet.

Utilization of Caddo Gas.—The amount of gas escaping naturally at the surface near the old Savage and Morrical well was formerly collected and used for fuel and light in a frontiersman's cabin.

Producers' No. 1, a few hundred yards northwest of Oil City, now blowing salt water and gas, was the first well to furnish a large amount of gas for drilling purposes in the field. The Citizens' Oil and Pipe Line Company, with a capitalization of \$3,000,000 put down the first gas pipe-line (6-inch) to Shreveport in the fall of 1905 and early part of 1906. Gas was first distributed May 20, '06. For domestic purposes the price charged was 35c per 1,000 cubic feet, for manufacturing and general power purposes 17.5c. A second pipe line was laid in 1907, and in the latter part of 1908 an 8" line was carried north from Lewis to Texarkana. Dixie began to use natural gas from the wells nearby in the fall of 1908, and a line was carried northward to Belcher.

By far the greatest undertaking relative to the utilization of natural gas from the Caddo field is that of the Busch-Everett people of St. Louis, who have received a franchise to furnish New Orleans with this fuel. To successfully lay a 16, 20 or 24-inch pipe a distance of 400 miles, crossing bayous, swamps and even the Atchafalaya and the Mississippi rivers, is certainly considerable of an undertaking, involving doubtless an expenditure of \$10,000,000. Prices for gas in New Orleans will vary from 35 to 45 cents per thousand cubic feet in accordance with the amount used. The line is to be operated in two and one-half years.

St. Louis has been mentioned as a possible market for Caddo gas.

Analysis of Caddo Gas.—The analysis and remarks of Prof. C. F. Phillips, already frequently quoted in scientific journals, are as follows:

Analysis of Caddo Gas.

Methane	95.00
Nitrogen.....	2.56
Carbon dioxide.....	2.34
Hydrogen	.00
Carbon monoxide.....	.00
Ethylene	.00
Sulphide (Sulph. hyd.?).....	.01

"I think you have a valuable fuel in this gas, well suited for household heating or metallurgical purposes and for all purposes to which natural gas is applied."

LOGS OF REPRESENTATIVE WELLS IN THE CADDO FIELD.

Log of Filer No. 1.

(Record received from Mr. Plumb.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Clay	75	75	Shale.....	50	1,040
Sand.....	5	80	Gumbo	29	1,069
Dark Clay.....	20	100	Gumbo.....	51	1,120
Rock.....	4	104	Shale.....	80	1,200
Clay	11	115	Lime, soft.....	100	1,300
Rock.....	3	118	Lime, hard.....	140	1,440
Shale	57	175	Rock.....	10	1,450
Rock.....	2	177	Lime, soft.....	80	1,530
Shale..	148	325	Rock	10	1,540
Rock	3	328	Lime, soft.....	25	1,565
Shale.....	172	500	Shale.....	115	1,680
Rock	4	504	Gumbo... ..	80	1,760
Gumbo.....	121	625	Shale, hard.....	115	1,875
Rock.....	5	630	Rock.....	5	1,880
Gumbo	50	680	Shale	110	1,990
Shale, hard.....	20	700	Rock.....	8	1,998
Shale, soft — some			Shale.....	52	2,050
gas.....	20	720	Rock	10	2,060

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Shale and gumbo..	90	810	Shale.....	75	2,135
Rock..	80	890	Rock.....	5	2,140
Shale, hard.....	60	950	Shale	100	2,240
Gumbo	40	990	Good oil sand.....	12	2,252

Log of Gulf Refining Company Hostetter No. 1.

(Record received from B. G. Dawes.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Clay and shale.....	29	29	Hard. white lime		
Hard dark sand			rock and broken		
rock	2	31	shale	210	1,530
Light gumbo and			Light gumbo mixed		
shale....	74	105	with kaolin and		
Dark lime rock.....	3	108	white shale.....	115	1,645
Light gumbo.....	15	123	Brown shale mixed		
Sand, rock and shell	1	124	with pyrite.....	2	1,647
Blue shale.....	176	300	Brown shale.....	14	1,661
Sand rock, shells			Brown shale and py-		
and shale*.....	10	310	rite	3	1,664
Blue shale and light			Gumbo turning to		
gumbo	338	648	shale	59	1,723
Brown shale—much			Hard brown shale..	19	1,742
gas	27	675	Coarse brown pack-		
Shale and gumbo..	131	806	ed sand.....	8	1,750
Soft sand rock—gas	2	808	Light brittle gumbo	30	1,780
Brown sandy shale.	7	815	Coarse brown pack-		
Hard brown shale..	5	820	ed sand.....	6	1,786
Top of Caddo gas			Light gumbo and		
sand at.....		821	blue shale.....	44	1,830
Gas sand.....	8	829	Coarse brown pack-		
Hard brown shale..	32	861	ed sand, almost		
Sand rock with gas.	2	863	sandstone	10	1,840
Hard brown shale,			Stiff blue shale....	68	1,908
soft at base.....	38	901	Brown packed sand.	7	1,915
Light gumbo mixed			Blue shale turning		
with white shale..	258	1,158	brown	89	2,004

* (Well balled here, showing a capacity of about 2,500,000 cubic feet of gas per day, but salt water flooded the hole at once.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Light lime rock.....	13	1,173	Stiff blue shale.....	96	2,100
Gumbo and blue shale	148	1,320	Light brown shale..	105	2,205
			Light colored gritty sandstone with gas and oil.....	4	2,209

Log of McCormick's Shreveport Brickyard Well.

(Log received from W. McCormick.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Gray clay.....	20	20	Gumbo (pyrite in the last few feet).	150	960
Lignite	4	24	Rock	2	962
Gray shale.....	60	84	Shale.....	138	1,100
Shale	16	100	White rock with shale mixed.....	500	1,600
Shale and pipe clay.	80	180	Clay and gumbo....	200	1,800
Gray shale.....	120	300	Sand rock at.....		1,800
Brown shale.....	100	400	Rock and shale....	100	1,900
Dark shale.....	200	600	Gumbo and shale...	100	2,000
Shale and rock....	200	800			

*Log of B. G. Dawes and Gulf Refining Company Poscy No. 1,
Vivian, La.*

(Record received from B. G. Dawes.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Clay and yellow sand	197	197	Gumbo	1	1,006
Blue sand.....	53	250	Rock.....	1	1,007
Shale	8	258	Blue shale, with hard streaks.....	11	1,018
Rock	3	261	Boulders	2	1,020
Water sand, blue and yellow.....	209	470	Shale	5	1,025
Lime rock.....	1	471	Boulders	2	1,027
Rock.....	18	489	Blue shale.....	4	1,031
Sand	9	498	Hard rock.....	1	1,032
Boulders	40	538	Dark gumbo.....	12	1,044
Boulders, with soft places between...	12	550	Rock	2	1,046
			Gumbo	8	1,054
			Blue shale.....	48	1,102

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Rock	5	555	Gumbo	6	1,108
Rocks, with soft places between...	4	559	Gray rock with sand	5	1,113
Rock	6	565	Bastard shale.....	11	1,124
Rock and sands....	35	600	Gray rock with sand	1	1,125
Rock with soft streaks	75	675	Dark shale.....	10	1,135
Gumbo	21	696	Gray rock.....	1	1,136
Soft rock and sand.	1	697	Blue shale.....	29	1,165
Gumbo	29	726	Rock sand.....	6	1,171
Gumbo.....	141	867	Blue shale.....	6	1,177
Boulders	1	868	Rock with soft streaks	48	1,225
Gumbo	15	883	Shale	63	1,287
Boulders	2	885	Gray rock with sand	2	1,289
Gumbo	14	898	White shale.....	40	1,329
Boulder	1	899	Sand rock.....	5	1,334
Black gumbo.....	13	912	Blue shale.....	22	1,356
Black shale.....	20	932	Gray rock, hard....	4	1,360
Shale	64	996	Gumbo	37	1,397
Rock, with gas.....	2	998	Boulder	1	1,398
Rock with pyrite...	7	1,005	Tough blue gumbo.	9	1,407

B. G. Dawes and Gulf Refining Company Heilperin No. 1, Vivian, La.

(Record received from B. G. Dawes.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Surface clay.....	7	7	Gray hard rock....	4	336
White sand.....	21	28	Blue shale.....	6	342
Quick sand.....	12	40	Gray rock.....	1	343
Gray sand.....	10	50	Bastard gumbo.....	12	355
Water gravel.....	6	56	Gray rock.....	1	356
Dark gumbo.....	5	61	Dark gumbo.....	20	376
Dark water sand...	24	85	Dark shale.....	24	400
Hard packed sand..	17	102	Gumbo	14	414
Water sand.....	53	155	Shale.....	10	424
Hard rock.....	5	160	Tough gumbo.....	277	701
Blue sand.....	21	181	Shale	6	707

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Gray rock.....	2	183	Gumbo.....	131	838
Dark sand.....	4	187	Shale with oil.....	22	860
Soft rock.....	1	188	Tough gumbo.....	8	868
Sand	4	192	Blue shale.....	12	880
Sandy rock.....	1	193	Dark gumbo.....	62	942
Blue sand.....	51	244	Gypsum, kaolin		
Rock	2	246	shale, or limestone		
Rock, gray and hard	3	249	show of oil.....	18	960
Blue sand.....	18	267	Blue gumbo.....	41	1,001
Bastard gumbo.....	13	280	Sandy shale.....	9	1,010
Blue shale.....	18	298	Black gumbo.....	52	1,062
Tough dark gumbo.	13	311	Rock.....	1	1,063
Boulders	2	313	Rock with gas.....	4	1,067
Dark shale.....	11	324	Gas sand.....	30	1,097
Black gumbo.....	8	332			

Log of Heywood No. 1 Fee.

(Record received from H. H. Jones, driller.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Clay, variegated,			soft	11	1,155
soft	80	80	Dark gumbo.....	53	1,208
Bluish sand, water			Dark shale.....	21	1,229
bearing	10	90	Dark gumbo.....	43	1,272
Clay, dark, soft....	50	140	Chalk, clayey to		
Hard dark rock....	2	142	white, oil from		
Dark soft clay.....	8	150	1,470 to 1,520....	328	1,600
Hard dark rock....	3	153	Black rocky gumbo.	100	1,700
Gumbo and shale,			Black sandy gumbo.	80	1,780
dark, full of boul-			Rock with some py-		
ders	447	600	rite	5	1,785
Gumbo and dark			Coarse, variegated		
shales	110	710	sand, with oil		
Shale, dark, with			smell	13	1,798
persistent gas....	10	720	Rock, in streaks sand		
Gumbo, dark and			and some pyrite..	62	1,860
very tough.....	100	820	Gumbo and shale...	112	1,972

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Rough, limelike rock			Tough gumbo.....	40	2,012
with gas.....	10	830	Shale and dark		
Dry sand rock, with			gumbo	118	2,130
gas and oil smell.	34	864	Rocky, with pyrite		
Rough lime rock...	5	869	and shells.....	13	2,143
Dry sand rock, with			Red and dark shale.	37	2,180
oil and gas.....	61	930	Blue shale.....	16	2,196
Hard rock.....	2	932	Rock	2	2,198
Sand rock.....	8	940	Soft rock.....	2	2,200
(Gas occurred in			Hard shale.....	24	2,224
this well from 820 to			Oil shale.....	3	2,227
940 feet.)			Hard shale.....	5	2,232
Shales, with streaks			Oil shale.....	4	2,236
of gumbo.....	39	979	Hard shale.....	3	2,239
Rock.....	2	981	Rock	3	2,242
Shale and gumbo			Brittle rock.....	10	2,252
with hard streaks.	163	1,144	Shale	5	2,257
Chalk, white and					

Log of Blanchard No. 1 Graham.

(Record received from Mr. A. G. Curtis.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Red and yellow clay	50	50	Shale with streaks		
Water sand.....	25	75	of shell rock....	20	1,900
Gray packed sand..	50	125	Shale	63	1,963
Gumbo and shell			Hard sand rock....	5	1,968
rock	30	155	Sand rock with		
Blue shale.....	29	184	Shells	90	2,058
Shale and iron con-			Very sticky gumbo.	32	2,090
cretions	26	210	Blue shale.....	92	2,182
Shale and iron con-			Shells of sand rock,		
cretions.....	30	240	with oil.....	11	2,193
Shale and gumbo...	81	321	Blue shale.....	87	2,280
Shale, rock and			Hard gumbo, shelly.	11	2,291
gumbo	80	401	Hard rock.....	1	2,292
Shell rock.....	29	430	Blue shale and white		
Shell and gumbo...	47	477	clay, small shells.	12	2,304

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Shale	98	575	Shale, with small		
Rock.....	4	579	shells and salt wa-		
Shell	10	589	ter	11	2,315
Shell rock.....	89	678	Shale with hard		
Shale and gumbo...	6	684	streaks	26	2,341
Shell rock at.....		684	Brown and blue		
Blue shale—first gas	16	700	shale.....	4	2,345
Blue shale, with oil			Sand rock.....	5	2,350
and gas.....	50	750	Red and blue shale.	20	2,370
Blue shale.....	87	837	Sand rock.....	10	2,380
Rock.....	3	840	Red and blue shale.	30	2,410
Tough gumbo.....	95	935	Shale	15	2,425
Shale and gumbo...	95	1,030	Very thin rock at..		2,425
Hard rock.....	8	1,038	Red and blue shale.	5	2,430
Hard shale, with			Sand rock breaks...	10	2,440
shell rock.....	31	1,069	Red and blue shale.	16	2,456
Rock	106	1,175	Rock.....	2	2,458
Solid gumbo.....	155	1,330	Blue shale.....	16	2,474
White rock or shale.	218	1,748	Rock sand.....	2	2,476
Gumbo	132	1,800	Blue shale.....	28	2,504

Log of Blanchard No. 1 Surrey.

(Record received from A. G. Curtis.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Sand and red clay..	63	63	White formation...	80	1,420
Shales and rocks...	117	180	White tough forma-		
Gumbo and rocks...	30	210	tion	50	1,470
Gumbo and shale..	30	240	Shale and shelly...	80	1,550
Shale	20	260	Gumbo and shale—		
Shale and gumbo..	80	340	some gas	60	1,610
Shale	60	400	Gumbo	30	1,640
Rock at		400	Gumbo and shale..	40	1,680
Shale	20	420	Gumbo	30	1,710
Shale, gumbo, rocks	40	460	Shale	40	1,750
Shale and rock....	115	575	Gumbo and shale..	25	1,775
Shale	95	670	Sand rock	60	1,835

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Rock, shelly	15	685	Gumbo with some		
Shale	20	705	gas	90	1,925
Gumbo	30	735	Gumbo	25	1,950
Shale	45	780	Sandy shale with		
Gumbo	10	790	hard streaks.....	25	1,975
Shale	12	802	Hard sandy shale....	25	2,000
Rock	5	807	Hard sandy shale		
Gas rock	5	812	with streaks of		
Shale	6	818	gumbo	100	2,100
Shelly, gas from 820			Shale	6	2,106
to 845 feet	27	845	Gumbo	17	2,123
Rock	1	846	Blue shale	12	2,135
Shale	18	864	Gray shale (white)..	9	2,144
Sandy shale rock...	2	866	Brown shale	4	2,148
Shale	54	920	Blue shale—gas rock		
Sandy shale	10	930	last six feet.....	17	2,165
Gumbo	35	965	Blue shale, hard-		
Hard shale	25	990	white	6	2,184
Gumbo	25	1,015	Blue shale, gas rock	16	2,200
Shale	20	1,035	Soft brown shale...	15	2,215
Gumbo, tough	40	1,075	Hard shale	5	2,220
Gumbo and shale..	105	1,180	White shale	5	2,225
Shale	20	1,200	Dark shale	5	2,230
Gumbo and shale—			Red, brown and blue		
turning white at			shale	13	2,243
base	60	1,260	Blue shale, sandy..	7	2,250
White shale, shelly,			Gray shale	4	2,254
with tough streaks			Brown shale	1	2,255
and show of oil			Oil bearing beds...	2.5	2,257.5
and gas	80	1,340			

Log of C. G. O. Hostetter No. 1 Gas.

(Record received from B. G. Dawes.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Brown and yellow			Blue hard gumbo..	64	375
clay.....	15	15	Soft sand rock shell	2	377
Gumbo and hard			Gumbo	45	422
blue sale	11	26	Hard sand rock....	3	425

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Gray colored lime			Hard tough gumbo...	65	490
shale	2	28	Soft sand rock.....	3	493
Soft blue shale....	24	52	Gumbo and light		
Gray colored hard			blue shale	144	637
lime shell	1	53	Kaolin, white shale,		
Gumbo and soft			or gypsum	11	648
blue shale	27	80	Soft sand rock (2.5		
Gray hard lime shell	2	82	to 3 million gas-		
Soft blue shale....	43	125	ser)	9	657
Gray hard lime shell	3	123	Kaolin or white		
Gumbo, hard and			shale, sandy at		
stiff	32	160	base	10	667
Rock shell, sandy			Hard stiff gumbo..	91	758
and soft	2	162	Hard sand rock....	3	761
Gumbo, blue and			Gumbo with sandy		
hard	58	220	shale at base....	16	777
Sand rock, with gas	2	222	Hard sandy shale..	3	780
Stiff blue shale....	58	280	Caddo gas sand,		
Soft sand rock....	3	283	quite hard, light		
Sandy brown shale,			in color, very		
with gas	27	310	sharp and gritty		
Hard sand rock....	1	311	with some gas....	3.5	783.5

Log of Broussard No. 1.

(Record received from B. G. Dawes.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Joint and red clays	65	65	in places—gas...	95	1,893
Water sand	7	72	Light shale	15	1,908
Rock shell	2	74	Big gumbo beads..	62	1,970
Blue shale and gum-			Blue shale, hard		
bo, with rock			at base	85	2,055
shells	316	390	Kaolin shale to light		
Hard dark shale			shale, hard.....	15	2,070
with gas	15	405	Hard kaolin shale..	12	2,082

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Blue shale and brittle gumbo, with kaolin and shale at base	342	747	Kaolin and sandy shale, with gas...	18	2,100
Caddo gas sand, broken with shale-gas	98	845	Broken hard sand rock with sandy shale layers.....	12	2,112
Hard shale and gumbo	15	860	Dark sandy shale with oil and gas.	18	2,130
Broken formation with coarse salt water, gravel at base	25	885	Loose soft blue shale	5	2,135
Blue shale, hard, with rock shells and gumbo	120	1,005	Hard rock	1	2,136
Kaolin shale beads then blue shale..	170	1,175	Sandy shale, with kaolin and a little pyrite, hard at base—gas and oil	38	2,174
Kaolin shales, with some blue shale and sand — gas and oil from 1,360 to 1,520 feet.....	360	1,535	Sandy shale with oil	23	2,197
Bastard lime and kaolin shale.....	85	1,620	Fine sand with oil.	3	2,200
Blue hard shale....	30	1,650	Sandy shale, red at base	3	2,203
Blue shale and gumbo	50	1,700	Red shale, turning light	15	2,218
Blue shale turning to soft brown shale	98	1,798	Mixed blue and red shale	6	2,224
Bastard lime rock, with sandy shale			Blue shale, red shale and sand	4	2,228
			Blue shale, sandy at base	7	2,235
			Sandy shale, with oil	2	2,237
			Mixed oil sand and dark shale, hard, good oil showing.	2	2,239

Log of Well Northwest of Plain Dealing, La.

(Record received from G. E. Gilmer.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Red clay	40	40	Salt water sand,		
Lignite	2	42	with gas	110	2,097
Yellow water sand. 10	52		Sandy shale with oil	106	2,203
Clay	8	60	Rotten shells	20	2,223
White water sand			Rotten shale with		
(artesian)	140	200	shells	260	2,483
Sandstone rock	2	202	White chalky rock. 45		2,528
Black packed sand. 493	695		Shale	4	2,532
Shale	300	995	White hard chalky		
Rotten shale and			rock	4	2,536
shells	200	1,195	Rotten shale with		
Tough blue gumbo. 420	1,615		shells	114	2,650
White chalky rock,			Shells	10	2,660
hard, with gas... 8	1,623		Rotten shale with		
Lime rock, with beds			shells	17	2,677
of sandy shale... 364	1,987		Rock	29	2,706
Gas found at 390, 1,220, 1,628, 2,000 and 2,700 feet.					
Oil found at 1,220, 1,630, 2,150 and 2,700 feet.					

Log of C. G. O. Noel No. 2, Mooringsport.

(Record received from S. S. Hunter.)

	Thickness Feet	Depth Feet		Thickness Feet	Depth Feet
Red clay	20	20	Gumbo and shale..	562	1,500
Water sand	15	35	White sand	45	1,545
Blue sand	15	50	Rock	1	1,546
Blue shale	35	85	Gumbo	57	1,603
Rock	1	86	Rock	8	1,611
Blue shale	19	105	Gumbo and shale..	107	1,718
Rock	1	106	Gumbo, hard	217	1,935
Shale	69	175	Rock	1	1,936
Rock	1	176	Salt water sand... 14		1,950
Blue shale	345	521	Gumbo and shale.. 71		2,021
Rock	1	522	Rock	2	2,023
Gumbo	389	911	Salt water sand with		
Gas sand, with gas. 19	930		gas	12	2,035
Salt water sand.... 8	938		White shale	429	2,464

ALPHABETICAL LIST OF THE WELLS IN AND ABOUT THE CADDO
WITH DATA CONCERNING EACH.*

Arnell and Lee No. 1.

See Lee and Arnell No. 1.

Augur and Henderson Well near Shreveport.

See Henderson and Augur Well.

Alday and Daniel No. 1.

See Daniel and Alday No. 1.

Barnhart No. 1. McGuire. NW, NW, NW, Sect. 21-20-15.

Began drilling April, 1907. A 15,000,000 gasser at 812 feet
June 5, 1907. Well capped.

Barnhart No. 2. McGuire. NE, NE, NW, Sect. 21-20-15.

Began drilling June, 1907. A 15,000,000 gasser at 795 feet
June 5, 1907. Well capped.

Belcher. A well was to be drilled here 17 miles north of Shreve-
port, February 3, 1907.

Benedum & Tree No. 1. On the J. Stiles.

Derrick up Oct. 6, 1908. Drilling Oct. 20-Nov. 20, 1908.

Big Four No. 1. NW, SE, Sect. 1-20-16.

Rig up Feb. 3, 1907. Down 1,560 feet June 5, 1907. Pro-
duced 500-600 barrels of oil which has to be treated. Also
called McCormick No. 1 on the Guy 5 acres. Well was being
cleaned Aug. 6, 1908.

Big Four No. 2. S, NW, SE, Sect. 1-20-16.

Drilled to 2,240 feet by Del Southerland. Had a good show-
ing of oil at 1,580 feet. A good producer. Well being
cleaned Jan. 10, 1909.

Black Bayou No. 1. Alexander. SE, SE, Sect. 9-20-15.

Derrick up Oct. 20, 1908. Drilling Nov. 6, 1908, to Jan. 20,
1909. Completed Jan. 20, 1909—a 125-bbl. well.

Black Bayou No. 1. Glassell. SW, Sect. 10.

Drilling from June 10, 1908, to Oct. 6, 1908. Completed
Oct. 6, 1908—a 300-bbl. well.

Blanchard No. 1. Surrey. NW, NW, SE, Sect. 12-20-16.

Formerly called Offenhauser No. 4. Drilling from Oct. 8,
1907, to Feb., 1908.

*Corrections and additions to the above data will be gladly received.
Information, to Feb. 15, 1909.

Blanchard No. 2. Surrey. NE, NW, SE, Sect. 12-20-16.

Completed July 6, 1908—a 100-bbl. well.

Blanchard No. 3. Surrey. S, SW, SE, Sect. 12-20-16.

Derrick up Sept. 20, 1908. Drilling from Oct. 6, 1908, to date. The well was shut down through November and part of December and January, 1909.

Blanchard No. 4. Surrey. NE, NE, SW, Sect. 12-20-16.

A derrick only.

Blanchard No. 1. Graham. Sect. 35.

Completed July 6, 1908. A dry hole at 2,504 feet.

Bossier City, Shreveport Well.

A water well owned by the Shreveport Cottonwood Co., struck gas at 500 feet and will drill deeper in search of oil.

Broussard No. 1. Brown. NE, NE, SW, SW, Sect. 18-20-15.

Drilling from Jan. 1, 1909, to date. Also called B. G. Dawes and others No. 1 Brown.

Broussard No. 1. Fee. SE, SW, SW, SW, Sect. 6-20-15.

Owner, B. G. Dawes. Congressman Oil Co. Drilling from June 1, 1908, to Aug. 1, 1908. Completed Aug. 1, 1908—a 100-bbl. producer. McCann & Harper, contractors.

Broussard No. 2. Fee. SE, SE, SW, SW, Sect. 6-20-15.

Drilled in clear lake bottoms. A hundred-barrel producer. Harper, driller.

Brown No. 1. S, NE, NW, NW, SW, Sect. 1-20-16.

Twisted off at 1,440 feet. Hole still remains 50 feet north of Hunter No. 1.

Brown Brothers No. 1. NW, SW, SE, Sect. 1-20-16.

Oil at 900-1,000 feet, heavy. At 1,300 feet the same oil was found as in the old Morrical-Savage well, July 3, 1905, completed at 1,560 feet, a 3 to 4 barrel well, Nov. 3, 1905. Afterwards made a 4 million gasser, Jan. 3, 1906. Owner, S. A. Nunnolley. Gas still being used Feb. 10, 1909.

Busch-Everett No. 1. Douglas. SW, Sect. 30-20-14. Dixie, La.

Drilling Jan. 20, 1909, to date.

Byron No. 1. McGuire. NE, SE, Sect. 17-20-15.

Equals old McGuire No. 1, his first well. A 20 million gasser at 802 feet.

(Caddo Gas and Oil Co. will be abbreviated to C. G. O.)

- C. G. O. Black Diamond No. 1, Black Diamond, Ark.
Drilling from June to October 1, 1907. A dry hole at 1,800 feet. C. E. Latham, driller.
- C. G. O. Caddo Lake Oil and Pipe Line Co. No. 1. SW, SW, Sect. 1-20-16. Quoted as C. G. O. Smith No. 6 in the Oil Investors' Journal. Derrick April 19, 1908. Drilling from July 20, to Dec. 20, 1908. A 2500-bbl. well from the 1,580 feet stratum, gravity 30 degrees Baume. The best well in the field.
- C. G. O. Caddo Lake Oil and Pipe Line No. 2. SW, SW, Sect. 1-20-16. Drilling from Dec. 17, 1908, to date.
- C. G. O. Caddo Lake Oil and Pipe Line No. 3. SW, SW, Sect. 1-20-16. Derrick up Dec. 20, 1908.
- C. G. O. Mary L. Cook No. 1. SW, Sect. 32. Began drilling Feb. 6, 1908.
- C. G. O. Croom Club House No. 1, SE, NE, NW, NE, Sect. 35-19-16. Drilling from Jan. 3 to Jan. 15, 1907. A gas well at 820 feet. C. E. Latham, driller. Is at present being deepened.
- C. G. O. No. 1 at Dixie, La. Drilling from Jan. 6, 1909, to date.
- C. G. O. Donnell No. 1. State Line Well, Texas, La. Due west of Vivian. Derrick up June 6, 1908. Drilling from July 20 to Oct. 6, 1908. Shut down at 1,175 feet, waiting for further orders. C. E. Latham, driller.
- C. G. O. Draper No. 1 at Draper, Texas. Began drilling March 7, 1907. Completed in June, 1907, a dry hole.
- C. G. O. Fee Simple. Sect. 1-20-16. Rig up May 5, 1908—a 200-bbl. well May, 1908.
- C. G. O. Gilbert No. 1 (*oil*), NW, NE, NE, Sect. 13-20-16. Drilling July 20 to Sept. 6, 1908. Completed Sept. 6, 1908—a 400-bbl. well. Gravity of oil 43 degrees Baume.
- C. G. O. Gilbert No. 2 (*oil*). NE, NE, NE, Sect. 13-20-16. Began drilling Sept. 20, 1908. Completed Nov. 6, 1908—a 90-bbl. producer.
- C. G. O. Gilbert No. 1 (*gas*). NE, NE, SE, Sect. 13-20-16. Formerly called Citizens' Oil and Pipe Line Co. No. 1 on the Gilbert tract, just north of the Caddo Lake. A great blow-

out, dynamited Nov. 4, 1906, to no advantage. This well is known as the burning mud and oil geyser.

- C. G. O. Gilbert No. 2 (*gas*). NW, NW, NE, Sect. 13-20-16. Drilling Oct. to Nov. 18, 1905. Completed Nov. 18, 1905, as a good gasser. This well was on the line to Shreveport Feb., 1906, but is not used at present.
- C. G. O. Gilbert No. 3. SE, NE, SE, Sect. 13-20-16. A good gasser, 1906, over which a new derrick has recently been built.
- C. G. O. Gilbert No. 4. SE, SE, SE, Sect. 13-20-16. Began drilling Oct. 12, 1906, completed in Nov., 1906, a good gasser at 775 feet. C. E. Latham, driller.
- C. G. O. Gilbert No. 5. NE, NE, NE, Sect. 13-20-16. Also called the Henning well—a gas well.
- C. G. O. Glassell No. 1. SW, SE, Sect. 10-20-15. Drilling from Jan. 6, 1909, to date.
- C. G. O. Harris No. 1, NW, SW, SW, Sect. 29-19-15. Derrick up Dec. 1, 1908, completed Dec. 17, 1908; a dry gasser, from the 800 stratum.
- C. G. O. Hiner No. 1, at Vivian, La. NW, SE, SE, Sect. 26-22-16. Began drilling July 20, 1908, completed Sept. 10, 1908; a dry hole. Drillers, C. E. Latham and J. E. Todd.
- C. G. O. Hostetter No. 1. Began drilling Jan. 7, 1907; completed Jan. 19, 1907; a 15-million gasser at 783 feet. W. H. Harper, driller. This well was turned in the gas line to Shreveport for a five-day test. It supplied Shreveport through 22 miles of 6-inch pipe and held a line pressure of 245 pounds at the Shreveport regulator station.
- C. G. O. Hostetter No. 3. Began drilling, Dec. 21, 1907; completed Jan. 4, 1908; a 7-million gasser at 780 feet. On a three-minute test it held a rock pressure of 300 pounds. The gas is dry and clean. Is at present on the Shreveport line as in No. 1 above.
- C. G. O. Hostetter No. 4. Began drilling Jan. 21, 1908; completed Feb. 11, 1908; a good gasser, at present on the Shreveport line. The depth of the well is 778 feet. This well was bailed at a depth of 777 feet and developed a volume capacity of 6.5 million cubic feet per day, and a rock pressure of 265 pounds on a two-minute test. The gas was

dry and clean. The well when shot in developed a peculiar phenomenon: The gas working back of the 8", and coming up to the bottom of the 10", only 83 ft. 9 in. from the surface; but the 10" pipe having been successfully cemented, the escape of the gas in this way was cut off. However, the gas within twelve hours from the time the well had been shut in, worked through crevices in the rock shell on which the 10" pipe had been set, and came up in a channel of Caddo Lake, extending out as far as one-half mile from the well. The surface of the lake had the appearance of a violent storm—the escaping gas blowing the water as high as 20 feet in places, but as soon as the well was opened up the gas came back through the 8" and the escape by way of the lake ceased. The well was at once lubricated and killed by pumping it full of mud. The 8" was pulled and a well packer set 65 feet from the bottom, and the casing then reduced to 6"; then a string of 8" pipe was washed over the 6" to the well packer. As the 8" was withdrawn, the well was filled in back of the 6" with concrete to the top of the ground. After allowing it to set for three days the well was again baled in and allowed to blow open for seven days to let the concrete set thoroughly. The well when shut in was in good shape, and no further escape of gas occurred. After standing for a few days it was connected in the line to Shreveport, and is now supplying the latter city (Jan. 1, 1909,) with gas. J. M. Guffey Pet. Co. and S. S. Hunter, owners; W. H. Harper, contractor; J. B. McCann, agent.

- C. G. O. Hunter No. 1. E. NW, SW, Sect. 1-20-16. The first shallow well, about 1,580 feet deep; a 300-barrel well.
- C. G. O. Hunter No. 2. S. NW, SW, Sect. 1-20-16. Began drilling Nov. 20, 1908; completed Jan. 20, 1909; a 65-barrel well.
- C. G. O. Leary No. 1, at Leary, Tex., on the Midden farm. Began drilling Oct. 22, 1907; completed March 7, 1908; a dry hole at 1,800 feet.
- C. G. O. McDowell No. 1. Completed June 20, 1908; a dry hole; may drill deeper. This well was abandoned after a blowout, June 20, 1908.

- C. G. O. McDowell No. 2. Completed Aug. 20, 1908; a dry hole; may drill deeper.
- C. G. O. Noel No. 1. NE, NW, SE, NW, Sect. 1-19-16. A gas well, capped.
- C. G. O. Noel No. 2. S, NW, NW, Sect. 1-19-16. Completed at 2,460 feet; a dry hole.
- C. G. O. Noel No. 3. NW, NW, SE, NW, Sect. 1-19-16. Completed in December, 1906; a gas well at 860 feet.
- C. G. O. Offenhauser No. 1. NE, SE, Sect. 1-20-16. Formerly called Caddo Oil and Mining Co., Hunter & Hughes No. 1. Completed June 5, 1907; a 150-barrel well with some gas, at 2,170 feet. A small derrick was used in drilling this well. The well is not producing now.
- C. G. O. Offenhauser No. 2. NE, SW, Sect. 1-20-16. Formerly called Citizens' Oil and Pipe Line Co. No. 2, or the Hughes-Offenhauser well. Completed May 1, 1908; a 250-barrel well.
- C. G. O. Offenhauser No. 3. SE, NE, SW, Sect. 1-20-16. Formerly called Thompson No. 1. Rig up May 5, 1908. Began drilling May 19, 1908; completed Oct. 20, 1908; a 75-barrel well.
- C. G. O. Offenhauser No. 4. NW, NE, SW, Sect. 1-20-16. Formerly called the Thompson No. 2. Drilling July, 1908; at present a small producer.
- C. G. O. Pardue No. 1, at Vivian, La. SW, NW, Sect. 1-21-16. Completed Dec. 6, 1908; a 2½-million gasser.
- C. G. O. Smith No. 1. SE, SE, Sect. 1-20-16. Formerly called the McCormick gas well. A gasser from 800-foot stratum.
- C. G. O. Smith No. 2. NE, SE, SW, Sect. 1-20-16. Formerly called the Baby well. At 1,050 feet the well was bailed January, 1905, and developed salt water, flowing 80 feet above the derrick. After 203 days' flow it developed pure gas, and is at present a small gasser.
- C. G. O. Smith No. 3. N, SE, SW, Sect. 1-20-16. Began drilling June 7, 1907; completed Oct. 2, 1907. After setting the strainer a big salt water well with gas and oil developed. On trying to pull the strainer the same became choked and blew out. The well flowed for several days, a 15-barrel well with much salt water, but drowned out in

ten days. In setting the 4" pipe, the same parted at a collar when 100 feet from the bottom because of a defective joint under the elevator, completely plugging the hole. All the pipe but 150 feet was fished out and the whole was abandoned June 1, 1908.

C. G. O. Smith No. 4. SW, SE, SW, Sect. 1-20-16. Began drilling Nov. 28, 1907; completed Feb. 28, 1908, when the well was bailed in and developed from the deep sand a 500-barrel well. The oil was dark green in color and of 28.4 degrees Baume gravity at 60 degrees Fahr. This well was the best in the field when completed. The well was cleaned out Sept. 6, 1908, and is still a good producer.

C. G. O. Smith No. 5. SW, SE, SW, Sect. 1-20-16. Began drilling March 7, 1908; completed May 20, 1908; at 2,280 feet. Salt water drowned the well; 17 feet of cement was put in the bottom without effect. The well is not producing now.

C. G. O. Smith No. 6. NW, NE, SE, SW, Sect. 1-20-16. A derrick only.

Caddo Lake Oil and Pipe Line No. 1. Formerly called Savage Brothers and Morrical. This is the oldest well in the field. Rig up May, 1904; began drilling in June, 1904. A partial log is as follows: Lignite at 16 feet; rock, gravel and boulders to 300 feet; a good fresh water well at 85 feet; gas sand at 900 feet; 6" set at 1,400 feet; stopped drilling at 1,556 feet in cream-colored shale with pyrite, April 3, 1905. The well was bailed March 28, 1905, a five-barrel well; deepened in July, 1905; idle November, 1905; gasser Jan. 3, 1906; oozed oil of 34.7 gravity Baume August, 1906, but not in paying quantities. Well was abandoned June, 1907.

Caddo Lake Oil and Pipe Line Co. No. 2. A new well was started south of No. 1, May 18, 1905. A heavy gravity oil was found at 950 feet, down 1,035 feet in shale Jan. 3, 1906.

Caddo Lake oil and Refining Co. In this well rock was struck at 1,400 feet; oil at 1,5546 feet, of 35 degrees Baume. The oil came to within 700 feet of the surface Feb. 3, 1905.

Caddo Oil and Mining Co. Rig up Sept. 19, 1907.

Citizens' Oil and Pipe Line Co. S, SE, Sect. 8-19-16. Also called Jeter well.

Cooper and Heard No. 1. Cooper, Winfield, La. Drilling from Dec. 20, 1908, to date.

Crawford No. 1. McGuire. SW, SW, NE, SW., Sect. 17-20-15. A 15-million gas well.

Culliman and Jolly No. 1. NW, SE, SW, Sect. 18-20-15. Completed Dec. 18, 1906; a 15-million gasser at 110 feet; now owned by the Louisiana Oil Co.

Daniel and Alday No. 1. SW, SE, NW, Sect. 31-21-15. Blew out gas and salt water and is not now a producer.

C. G. Dawes Trustee No. 1. SE, NE, SW, Sect. 7-20-15. Began drilling March 17, 1908, but was lost before being finished. On the night of May 11, 1908, during a heavy rain storm, while putting back the 4" rotary pipe, and when about 350 feet from the bottom the well blew out from the gas stratum between 1,360 and 1,420 feet, making 40 million cubic feet of gas per day under very high pressure, and showing a small amount of salt water. While preparing to lubricate and kill the well, the derrick was completely destroyed by a cyclone on the evening of May 13th. Deeper gas worked out through the 8¼-inch casing in a defective seam or joint or under the bottom, and started the 800-foot or Caddo gas stratum to blowing out. It in turn worked through a split in the 10" pipe 20 feet below the surface and blew out a very large hole about 20 feet deep, around the top of the 10" pipe. After several days, the drillers succeeded in getting a joint of 14" over the 10" and in concreting a shoulder on the bottom of the 14" to the 10". Then they built a concrete anchor to the 14", hoping in this way to be able to hold the gas long enough to lubricate and kill the well by pumping it full of mud. But the gas caught fire and burned from June, 1908, till the night of Feb. 12, 1909. The gas was lighted the next morning, but went out again within five minutes. Some salt water appeared, and with the gas forms a spray that still rises above the old hole. This well is the one which has been noted as the *burning gas well*.

C. G. Dawes Trustee No. 2. SE, SE, NE, SW, Sect. 7-20-15. Began drilling June 22, 1908; completed August, 1908; a

- 10 to 15-barrel well, with much salt water. At present not producing.
- B. G. Dawes and C. G. O. No. 1. Christian, at Vivian, La. A location only.
- B. G. Dawes and Gulf Refining Co. Heilperin No. 1. NW, SE, NW, Sect. 31-22-15. Began drilling Sept. 29, 1908; completed Oct. 22, 1908; a 15-million gasser. S. B. Clement, driller.
- B. G. Dawes and Gulf Refining Co. Posey No. 1. SE, NE, NW, Sect. 25-22-16. Began drilling Sept. 15, 1908; completed Oct. 28, 1908; a dry hole.
- Dawes No. 1. J. W. White. Rig up July 20, 1908; taken down since.
- Dixie Oil and Pipe Line Co. No. 1. A 2,250-foot well; abandoned Sept. 19, 1907.
- Dixie No. 2. Glassell. SE, Sect. 36, 5½ miles east of Mooringsport; a gasser Sept. 19, 1907.
- Dixon Oil and Pipe Line Co. Sect. 22-20-15, four miles east of Mooringsport. Gumbo at 875 feet, shale and sand at 2,025 feet.
- Dixon Oil and Pipe Line Co. No. 1. NW, SW, NW, Sect. 33-21-15. On Pine Island one-half mile east of Texla No. 1. A blowout occurred at 2,165 feet; killed and deepened to 2,500 feet. Casing pulled out June 19, 1907.
- Dixon Oil and Pipe Line Co. No. 2. NW, NW, SW, Sect. 33-21, 15. Completed as a gasser at 840 feet, about 1.2 million capacity, March 19, 1907.
- Enterprise No. 1. Noel. Sect. 12-20-16. Completed June 19, 1908. A fairly good producer.
- Enterprise No. 2. Noel. Sect. 12-20-16. Completed Sept. 6, 1908; a 10-barrel well, 70 barrels gross.
- Enterprise No. 3. Noel. NE, SW, NW, NE, Sect. 12-20-16. A derrick only.
- Evans No. 1. McGuire. SE, NE, SE, SW, Sect. 18-20-15. A 15-million gasser at 812 feet, June 5, 1907.
- Evans No. 2. McGuire. E, SE, SE, NW, Sect. 18-20-15. A 15-million gasser, 2,000 feet north of Evans No. 1, June 5, 1907.
- Evans No. 3. McGuire. NE, NW, NE, SE, Sect. 18-20-15. A good gasser, June 5, 1907.

- Filer No. 1. NE, NW, NW, SE, Sect. 7-20-15. Completed July 28, 1908; a 140-barrel well, now producing very little.
- Filer No. 2, just SE of the center of Sect. 7-20-15. Derrick up July 20, 1908; completed Nov. 6, 1908; a 30-barrel well.
- Filer No. 3, or 1-18. S, NW, NW, NE, Sect. 18-20-15. Completed Feb. 6, 1909; a 100-barrel well.
- Gulf-Broussard No. 1. Pitts. Sect. 20-20-15. Began drilling Feb. 6, 1909.
- Gulf Refining Co. No. 1. Christian. NE, SW, SW, Sect. 30-20-15. Rig up Feb. 6, 1909.
- Guffey-Christian No. 1. Sect. 31. Derrick up May 5, 1908; blown over by a high wind and site abandoned.
- Gulf Refining Co. No. 1. Curtis. N, NE, SE, Sect. 19-20-15. Derrick up Jan. 1, 1909; began drilling, Feb. 6, 1909.
- Guffey No. 1. Dixon Farm. NW, Sect. 33-20-15. On Pine Island; down 2,200 feet June 5, 1907.
- Gulf Refining Co. No. 1. Edwards. NE, Sect. 31-20-15. Began drilling Feb. 6, 1909.
- Gulf Refining Co. No. 1. J. Harris. Sect. 32-19-15. Began drilling Jan. 6, 1909.
- Guffey-Hostetter No. 1. SE, Sect. ————. Began drilling Jan. 22, 1907; March 19, 1907, the well blew out at 2,208 feet, with 613 feet of 8-inch casing in the hole. When 2,209 feet was reached, the well was shut down and preparations were made to set the 6-inch, but as soon as the pump pressure was shut off the well at once blew out, and at the time having only 613 feet of 8-inch casing in the hole, was completely destroyed by the terrific gas pressure, the well developing a rock pressure of close to 1,000 pounds. After blowing out for three days, deep gas stratum was choked off by the collapsing of the 4-inch rotary pipe and caving of the shales. The well was then coffer-dammed around the 8-inch to a depth of 29 feet on top of the first rock stratum, and after driving a string of 12-inch pipe around the 8-inch, it was then concreted to the top of the ground and in this way the well was shut in finally, and the blowout stopped. This well when the gate was opened during the fall of 1908, began to flow and averaged from 10 to 30 barrels of high-grade oil per day for several months,

but finally stopped flowing when a well was brought in near by.

Guffey-Hostetter No. 2. Began drilling June, 1908; completed Dec. 8, 1908. A 300-barrel well. This well was claimed to be making 10,000 barrels when first completed, and caused a great stir in the field, but later reports show that its average capacity is nearer 200 barrels.

Gulf Refining Co. No. 3. Hostetter. Began drilling Feb. 6, 1909.

Gulf Refining Co. No. 1. Mason. Began drilling Feb. 6, 1909.

Gulf Refining Co. No. 2. Mason. Derrick up Jan. 6, 1909.

Gulf Refining Co. No. 1. Nunnelley. Derrick up December, 1908; began drilling January, 1909.

Guffey-Pitt No. 1. NW, NW, NW, Sect. 7-20-15. Derrick up July 3, 1905; now abandoned.

Gulf Refining Co. No. 1. Sorelle. SW, Sect. 30-20-15. Drilling January, 1909.

Hastings Oil Co. Rig up June 18, 1905.

Henderson and Augur well, near Shreveport, on Douglas Island. Abandoned at 2,250 feet Dec. 3, 1905. This well produces some salt water and gas; shoots ten feet in the air and the gas when lighted will burn for a short time, but soon goes out.

Heywood No. 1. Fee. NW, NW, SW, SE, Sect. 1-20-16. Began drilling, September, 1908; completed December, 1908; a dry hole at 2,257 feet. H. Jones, driller.

Heywood No. 1. Savage. SE, SE, NE, SE, Sect. 2-20-16. Drilling from December, 1908, to February, 1909; a dry hole, with show of oil in the 1,500-foot stratum.

Huckaby No. 1. McGuire. SE, SW, SW, Sect. 17-20-15. A 25-million gasser at 823 feet, June 5, 1907.

Jolly No. 1. See Culliman and Jolly No. 1.

Jolly No. 2. NW, NE, SW, SW, Sect. 17-20-15. A gas well drilled in 1907, now owned by Louisiana Gas Co.

Latex Oil and Pipe Line Co. No. 1. SW, SW, SW, Sect. 3-20-16. Twisted off at 800 feet, but found traces of oil July 18, 1905.

Latex Oil and Pipe Line Co. No. 2. S, SW, SW, Sect. 3-20-16. The third well drilled in the field, not producing now.

Lee and Arnett No. 1. Sect. 10-18-14. Began drilling in December, 1905; struck gas stratum at 975 feet, June 3, 1906.

This well is located three miles northwest of Shreveport and is not producing now.

Loe and Arnett No. 2. This well is located 900 feet west of No. 1, and struck gas at about the same depth; not producing now.

J. A. Libby. Had a derrick up on the S. A. Guy 30-acre tract June 18, 1905.

Lillie No. 1. N, NW, NW, Sect. 12-20-16. Completed June, 1908; a 100-barrel well, a fairly good producer.

Lillie No. 2. NW, NW, NW, Sect. 12, 20-16. Derrick up December, 1908; about Jan. 1, 1909, the hole was lost at 1,440 feet.

Lillie No. 2. second hole. This well is located about 10 feet north of the old Lillie No. 2, and is drilling (Feb. 6, 1909).

Lillie No. 3. Drilling Feb. 1, 1909.

Mansfield No. 1. NE, SE, SE, SE, Sect. 1-20,16. Began drilling December, 1908; completed February, 1909; a 125-barrel well.

Marshall Gas Co. No. 1. R. T. Cole, at Blanchard, La. Rig up Nov. 6, 1908; drilling from November, 1908, to date. This well and a half interest in the holdings of King Bros., the owners, were bought by Producers' Oil Co. The latter will drill to 1,500 feet or more. The well was down 1,100 feet in February, 1909.

Marshall Gas Co. No. 1, near Blanchard. Derrick up September, 1908; the well was never drilled.

Marshall, Texas well on the Blocker place, 10 miles southeast of Marshall, Tex. This well was down 1,500 feet January, 1909, and is still drilling.

Maxwell and Hardy No. 1. See Texla No. 1.

McCann and Harper No. 1. Pitts. NE, NW, Sect. 31-22-15. Drilling February, 1909.

McCormick No. 1. Croom. Derrick up Sept. 14, 1908; well completed February, 1909; a 50-barrel well. Driller, Del Southerland.

McCormick No. 1, Mooringsport. All traces of this derrick have been removed. The derrick was blown over by a strong wind and the site abandoned.

McCormick No. 2, Mooringsport. Also called Thompson No. 1. This derrick was also destroyed by a strong wind, and this site abandoned.

McCormick No. 1, Shreveport. Also called the Brickyard well. This well was drilled in the winter of 1904-5 and is the second oldest well in the field. It was drilled to 1,650 feet in search of gas as fuel for burning brick. At 910 feet there was a show of gas, but salt water spoiled all chances of obtaining a good well at this depth. The well was later drilled to a depth of 2,000 feet, but no oil was obtained.

McGuire Wells. See under the names of the individual wells.

Merchant No. 1. NE, NE, SW, SW, Sect. 6-20-15. Derrick up Dec. 25, 1908; drilling February, 1909.

Nichols Oil and Gas Co. No. 1, north of Paraloma, Ark. Began drilling August, 1908; down 535 feet Dec. 14, 1908. Driller, R. H. Ferguson, Milford, Ark.

Producer's Black Bayou No. 1. SE, NE, SE, SE, Sect. 7-20-15. Derrick up July 19, 1907; completed November, 1907; a 100-barrel producer, but the oil has to be cooked. This well had an initial capacity of 700 barrels.

Producer's Black Bayou No. 2. W, SE, SE, Sect. 7-20-15. Drilling from April to August, 1908; completed; a 50-barrel well with considerable gas.

Producer's Black Bayou No. 3. W, SW, NE, Sect. 18-20-15. Derrick up October, 1908; completed Dec. 7, 1908; a 90-barrel producer. The gravity of the oil in this well is 37.3 degrees Baume.

Producer No. 1. NW, SW, SE, Sect. 1-20-16. This well was a good gasser at 812 feet, but blew out and is now a large salt water blower.

Producer No. 2. C. O. and Min. Gas was struck in this well at 750 to 850 feet. The well was completed at 830 feet, but a blowout occurred, which blew sand and mud all over the derrick, April 13, 1905.

Producer No. 3, C. O. and Min. Drilling from June to July, 1905. A blowout occurred also in this well and the well was lost.

Producer's No. 4, C. O. and Min. This well was put down to kill the two blowouts, No. 3 and No. 4, on the Caddo Oil

and Mining lease. The well was completed March 9, 1906; a small gasser at 842 feet. When this well was brought in, the two geysers ceased to remain active, and their sites are now marked by salt lakes.

Producer's No. 5, C. O. and Min. SW, NE, Sect. 12-20-16.

This well is 2,000 feet south of No. 2. Rock was struck at 185 feet, sand and shale at 1,650 feet, and at 2,180 feet there was a strong gas pressure developed. The well was completed, a 190-barrel producer, Aug. 5, 1907.

Producer's No. 6, C. O. and Min. Commenced drilling Nov. 5, 1907; completed June 19, 1908; a 50-barrell well.

Producer's No. 7, C. O. and Min. Began drilling in April, 1908; completed June 19, 1908; a 100-barrel well.

Producer's No. 8, C. O. and Min. A derrick only.

Producer's No. 1. Evans. SE, SE, NE, Sect. 11-20-16. Completed April, 1908; a 35-barrel well, which has since turned mostly to gas.

Producer's No. 1. Fee. NE, Sect. 30-20-15. Mooringsport. Began drilling Jan. 20, 1909.

Producer's No. 1. Harrell. SE, NE, SE, Sect. 30-21-15. On Pine Island, one mile northwest of Texla No. 1, on the Harrell 204-acre tract. Began drilling November, 1906; completed in June, 1907; a dry hole at 3,000 feet; since abandoned. This well is the deepest in the field.

Producer's No. 2. Harrell. NE, SE, Sect. 2-21-16. Began drilling July, 1908, and is still drilling.

Producer's No. 1. Heilperin and Liebman. SW, NE, SW, Sect. 31-21-15. On Pine Island; a 75-barrel well at 1,400 feet. (?) Deepened and producing 20 barrels February, 1908.

Producer's No. 2. Heilperin and Liebman. NE, SW, NE, SW, Sect. 31-21-15. On Pine Island, 500 feet north of No. 1; reported a producer at 1,400 feet. A blowout occurred at 2,154 feet. The well turned to a gasser in June, 1908.

Producer No. 1. J. W. Holt. SE, NE, SE, SE, Sect. 2-20-16. Began drilling December, 1908; completed in February, 1909; a dry hole.

Producer's No. 1. Homestead. Sect. 12-20-16. Began drilling February, 1908; completed May, 1908; a 100-barrel well.

- Producer's No. 2. Homestead. S, SW, SE, SE, Sect. 12-20-16.
Began drilling September, 1908; twisted off and abandoned.
- Producer's No. 3. Homestead. SW, SE, SE, Sect. 12-20-16.
Began drilling November, 1908, with the rig formerly used
in drilling No. 2; completed Jan. 6, 1909; a 70-barrel well.
- Producer's No. 1. Lane. Began drilling in June, 1908; com-
pleted September, 1908; a 400-barrel well.
- Producer's No. 2. Lane. NW, NE, NW, Sect. 18-20-15. Began
drilling June, 1908; completed October, 1908; a 300-barrel
well. This well has been often reported to be making from
2,000 to 3,000 barrels, and probably is good for 500 barrels.
- Producer's No. 3. Lane. SW, SE, NE, NW, Sect. 18-20-15.
A derrick only, Dec. 15, 1908.
- Producer's No. 4. Lane. SW, SW, NE, NW, Sect. 18-20-15.
Began drilling December, 1908.
- Producer's No. 1. Leonard. NW, NE, NW, NW, Sect. 6-20-15.
On Pine Island. Began drilling February, 1907; a 9-million
gasser at 2,128 feet, April, 1907
- Producer's No. 1. J. Milam. SW, Sect. 9-19-15. Began drill-
ing February, 1909.
- Producer's No. 1. Murray. NW, NE, SE, Sect. 12-20-16. Be-
gan drilling October, 1907; completed January, 1908; a
100-barrel well.
- Producer's No. 2. Murray. NE, NE, NE, SE, Sect. 12-20-16.
Began drilling July, 1908; completed Feb. 6, 1909; a gasser.
- Producer's No. 1. Murray, Colquitt and Hardy. NW, NW,
Sect. 18-20-15. Began drilling September, 1908; comp-
leted December, 1908; a 125-barrel well.
- Producer's No. 1. Richardson. NE, NW, NW, Sect. 12-20-16.
Began drilling May, 1908; completed Aug. 20, 1908; a
50-barrel well.
- Producer's No. 1. Ruddersdorf. NE, NE, NW, Sect. 11-20-16.
Began drilling June, 1908; shut down since January, 1909.
Well was never completed.
- Reliance No. 1. SE, NW, NW, NW, Sect. 7-20-15. Formerly
called Richardson No. 1; on the R. L. Pitts. Began drill-
ing January, 1907; was a gasser from October to Decem-
ber, 1907, from the 2,200-foot stratum. A blowout oc-
curred and at present the well is a salt water blower.

Reliance No. 2. NW, NW, Sect. 7-20-15. Began drilling Nov. 17, 1907; completed April 27, 1908. After bailing, while withdrawing the 2½-inch washpipe the well came in as a 25-million gasser. In the confusion the 2½-inch pipe fell in the hole; all was gotten out but the last five joints. When bailed in again, it came in as a 25-barrel well and a 15 to 20-million gasser. In a few days the gas decreased and the oil increased in volume, and on June 1, 1908, the well was making 12 to 15 million cubic feet of gas and 175 barrels of oil. It is still a good producer.

Reliance No. 3. Pitts. SW, NE, SW, NW, Sect. 7-20-15. Began drilling in December, 1908; completed February, 1909; 75 barrels.

Richardson No. 1. Pitts. See Reliance No. 1.

Richardson No. 2. Pitts. See Reliance No. 2.

D. C. Richardson No. 3. SW, SE, NE, NW, Sect. 32-20-15. On Pine Island, 600 feet northwest of Texla No. 1. Shale and sand at 1,820 feet; at 2,085 feet a blowout occurred, and on May 19, 1907, hole fell in 250 feet, and at present the well is a salt water blower with a depth of about 1,750 feet.

Richardson No. 4. SW, NE, NW, Sect. 32-20-15. Shale and sand, with oil, at 2,068 feet; a 300-barrel well, November, 1907.

Richardson No. 5. SE, SE, NE, NW, Sect. 32-20-15. Completed Oct. 25, 1908; a 3,900-barrel well. On October 27, 1908, it went to mud and sand, and then stopped producing.

Richardson No. 6, SW, SW, NE, NW, Sect. 32-20-15. A derrick only; on Pine Island.

Richardson No. 1. Guy. NE, Sect. 32-20-15. Drilling began in January, 1909.

Richardson No. 1. Nunnelley & Richardson. SE, SE, Sect. 25-21-16. Began drilling December, 1908.

Richardson No. 1. Richardson. SE, NW, SW, SW, Sect. 1-20-16. Began drilling December, 1908; a dry hole January, 1909. Shot with nitro-glycerine without effect.

Rogers No. 1. Rogers; at Lewis. Sect. 24-21-16. At 2,000 feet gas began to escape through the cracks in the ground and finally the derrick and all fell in. Estimated capacity 40

million cubic feet of gas in August, 1908. This well became a salt water blower, but was successfully killed by Brown Brothers, the drillers. In December, 1908, operations were commenced to go deeper.

Rogers No. 2. Rogers; at Lewis. Sect. 24-21-16. Began drilling July, 1908; completed Sept. 6, 1908; a big gasser (40 million cubic feet) at 1,035 feet.

Rogers No. 3. Rogers; at Lewis, La. SW, Sect. 24-21-16. Began drilling December, 1908.

Savage Brothers and Morrical. See Caddo Lake Oil and Pipe Line Co., ditto.

Savage and Richardson No. 1. One-quarter mile north of Savage Brothers and Morrical, in the northeast corner of Caddo town site. Thirty-eight feet of oil sand was struck at 2,280 feet; the oil was 27-degree gravity Baume. The well was pumped at the rate of 40 barrels and turned to salt water Nov. 18, 1906.

Savage and Richardson No. 2. Five hundred feet NW of Producer's No. 1, Heilerpin and Liebman; Nov. 18, 1906.

Savage No. 2. NW, NW, Sect. 1-20-16. Estimated at 2,200 feet, June 5, 1907.

School No. 1. McGuire. SW, SW, NW, SW, Sect. 16-20-15. A 20-million gasser at 805 feet, June 19, 1907.

School No. 2. McGuire. SE, SE, SW, NW, Sect. 16-20-15. A 20-million gasser at 825 feet, Aug. 19, 1907.

Shreveport Petroleum Co. No. 1. Fifteen hundred feet northwest of the center of Section 1, near Savage No. 2. Oil was found at 2,200 feet in June, 1907.

Staiti No. 1. SW, Sect. 31-20-15. Mooringsport, on the Ward tract. Began drilling February, 1909.

St. Louis and Southwestern Oil Co.; near Mooringsport. Twisted off at 800 feet, January, 1906.

St. Louis Oil and Pipe Line Co., south of Mooringsport. Down 900 feet and shut down.

Texla No. 1. NW, NE, SW, NE, Sect. 32-21-15. On Pine Island. The well that opened this district. A 275-barrel oil well, plus 20% of salt water, December, 1906. Slightly deepened, the well flowed by head 150-200 barrels 20 degree gravity

- Beaume oil. The well was deepened to 2,264 feet and developed salt water. The casing was pulled August, 1907.
- Texla No. 2. NW, SW, NE, Sect. 32-21-15. On Pine Island, within 300 feet of No. 1. Abandoned at 2,300 feet, June 5, 1907, because the well developed salt water. The casing was pulled and the hole was abandoned.
- Texla No. 3. NE, SE, NW, Sect. 32-21-15. On Pine Island. Began drilling April, 1908; completed Aug. 20, 1908; 300 barrels net, with some salt water.
- Thompson No. 1. See McCormick, ditto.
- Trees and Benedum No. 1. See Benedum and Trees No. 1.
- Trees No. 1. Dixon. Began drilling August, 1908; completed Nov. 6, 1908; a dry hole.
- Trees No. 2. Dixon. Shut down through June and July, 1908, because of high water.
- Trees No. 1. S. A. Guy. Derrick only.
- Trees No. 1. Heilperin and Liebman. NE, NE, NW, Sect. 32-21-15. On Pine Island. Began drilling June, 1908; completed Nov. 6, 1908; a dry hole.
- Trees No. 3. Ruddersdorfer. SE, SE, NE, Sect. 11-20-16. Derrick only.
- J. C. Tree's Oil Co. No. 1. NW, Sect. 27-21-16. On the W. P. Stiles tract, west of Lewis Station. Brown Brothers, drillers. Completed Dec. 6, 1908; 50 barrels of oil with a large amount of gas at 1,060 feet; Jan. 20, 1909, the hole was deepened, and by pumping with a standard rig 300 barrels of oil and 300 barrels of water were produced daily. February, 1909, the daily capacity was stated to be 125 barrels. This well is the farthest west in the field.
- Vivian Oil Co. No. 1. Childs. Owned by the Dawes Co. Began drilling in November, 1908; completed Dec. 18, 1908; a 75-barrel well with a small amount of water.
- Vivian Oil Co. No. 1. Edwards. Owned by the Dawes Co.; began drilling in August, 1908; completed September, 1908; a 25-barrel well.



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